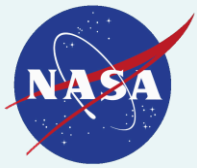


NASA Global Hawk HS3 Operations Overview



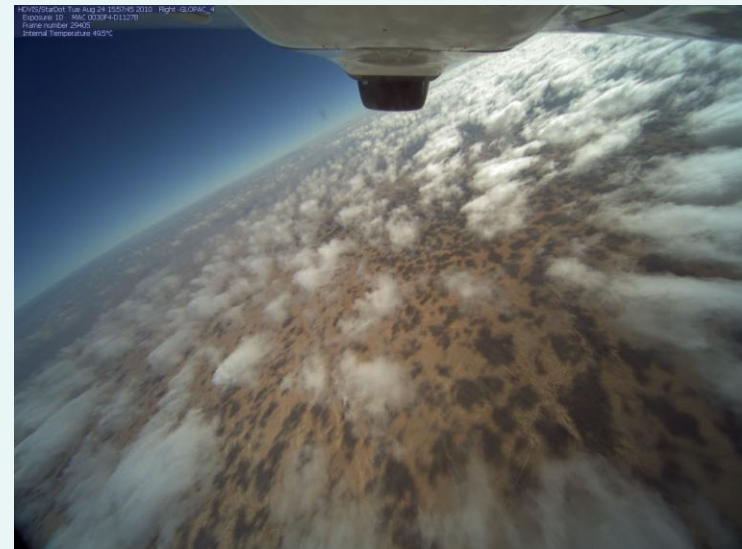
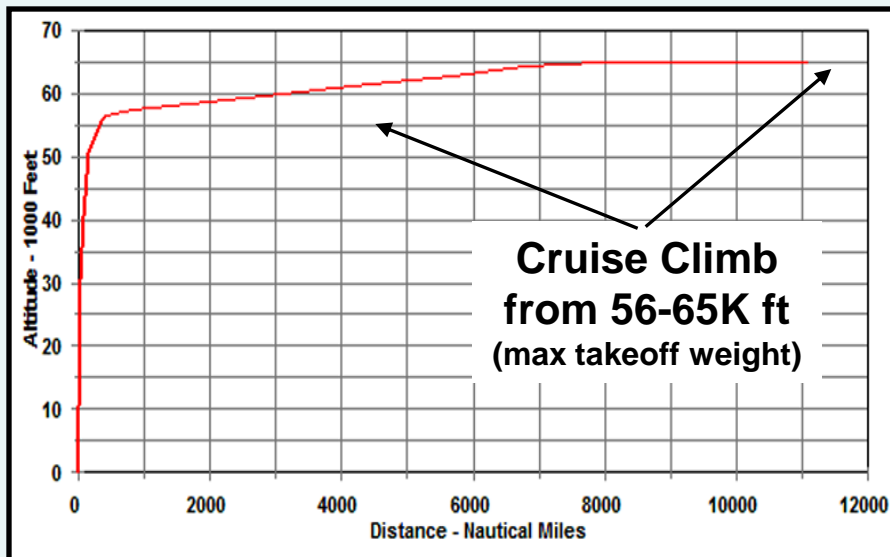
**Dave Fratello, Payload Manager
October 19, 2010**

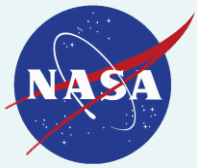


NASA Global Hawk System

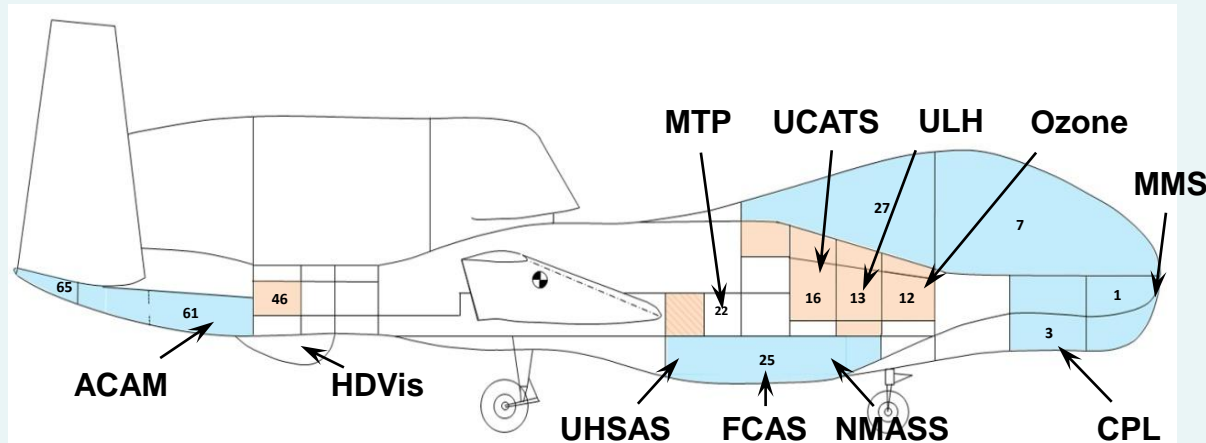


Endurance	> 30 hours
Range	>11,000 nmi
Service Ceiling	65,000 ft
Airspeed (55K+ ft)	335 KTAS
Payload	1,000-1,500 lb
Length	44 ft
Wingspan	116 ft

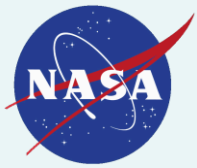




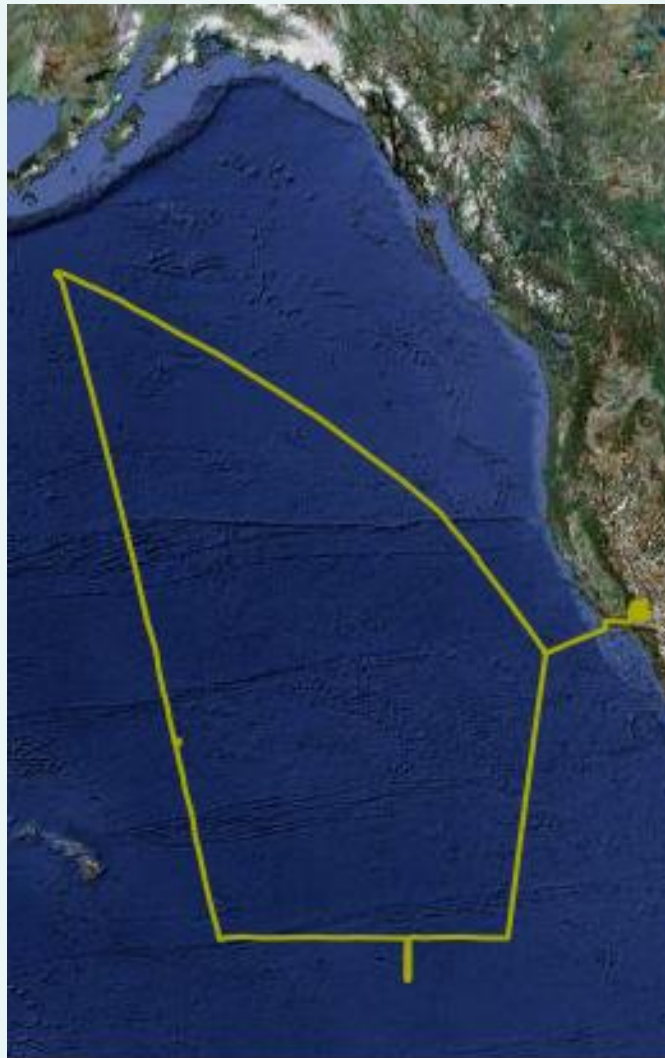
GloPac '09 Payloads



- ACAM** - Airborne Compact Atmospheric Mapper
- CPL** - Cloud Physics LIDAR
- FCAS** - Focused Cavity Aerosol Spectrometer
- MMS** - Meteorological Measurement System
- MTP** - Microwave Temperature Profiler
- HDVis** - HiDef Video System
- NMASS** - Nuclei-mode Aerosol Size Spectrometer
- Ozone** - NOAA UAS Ozone
- UCATS** - UAS Chromatograph for Atmospheric Trace Species
- UHSAS** - Ultra-High Sensitivity Aerosol Spectrometer
- ULH** - UAS Laser Hygrometer



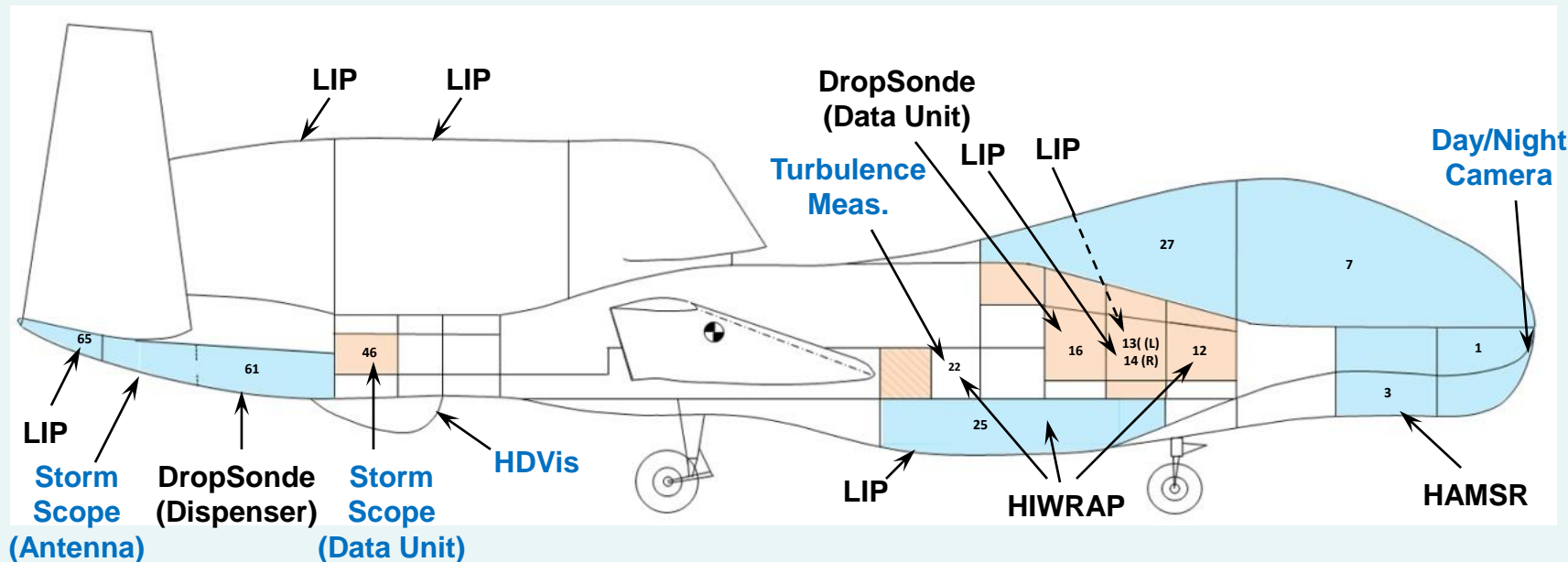
GloPac Mission Recap



3 Flights, 67 hours, 22,300 nm



GRIP '10 Payloads

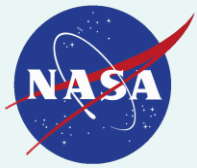


LIP - Lightning (and Electric Field Meas.) Instrument Package

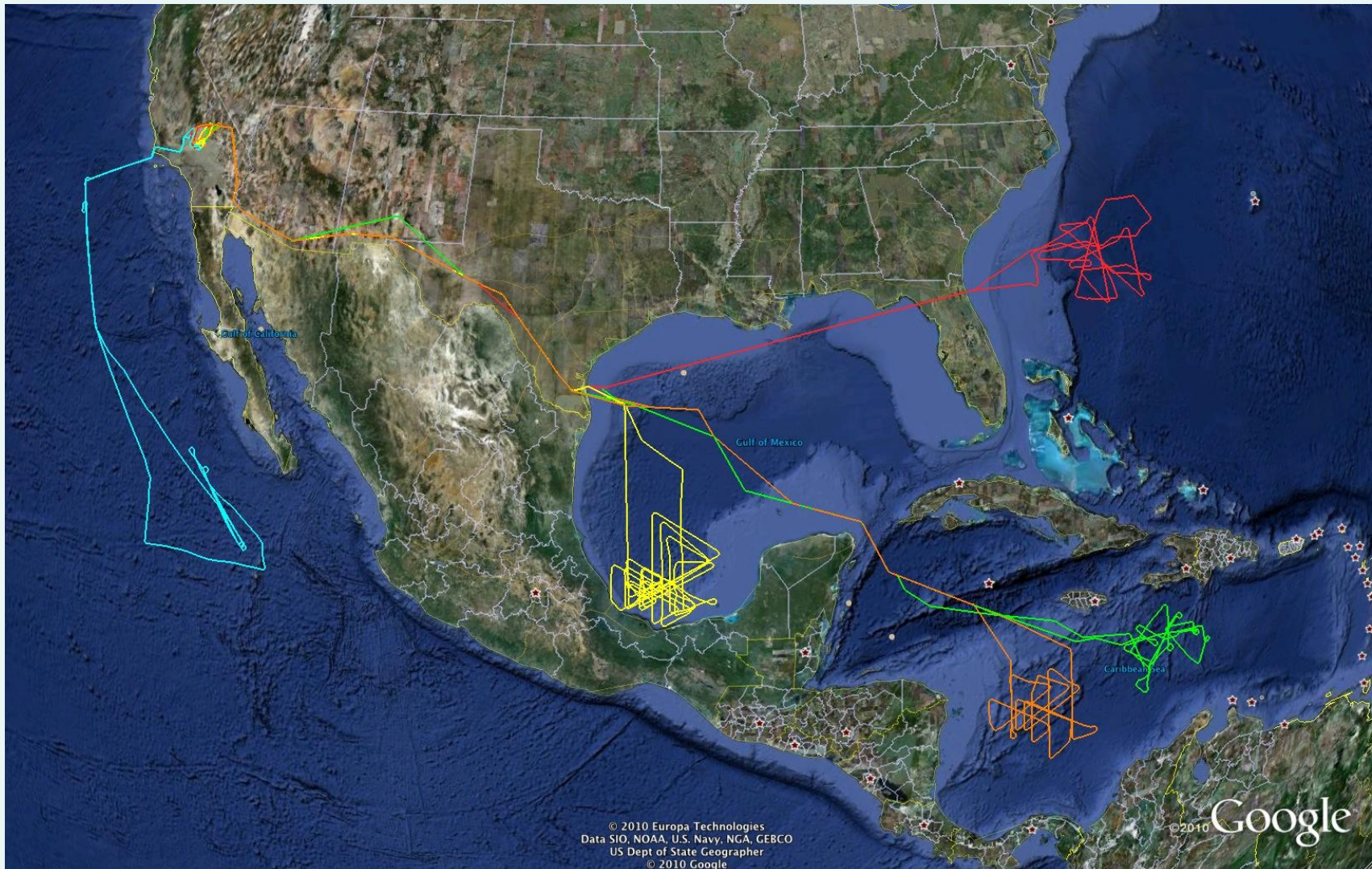
HAMS - High Altitude MMIC Sounding Radiometer

HIWRAP - High Altitude Imaging Wind and Rain Profiler

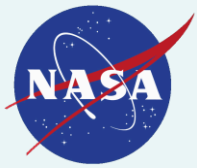
DropSonde - NOAA DropSonde System (75 dropwindsondes)



GRIP Mission Recap



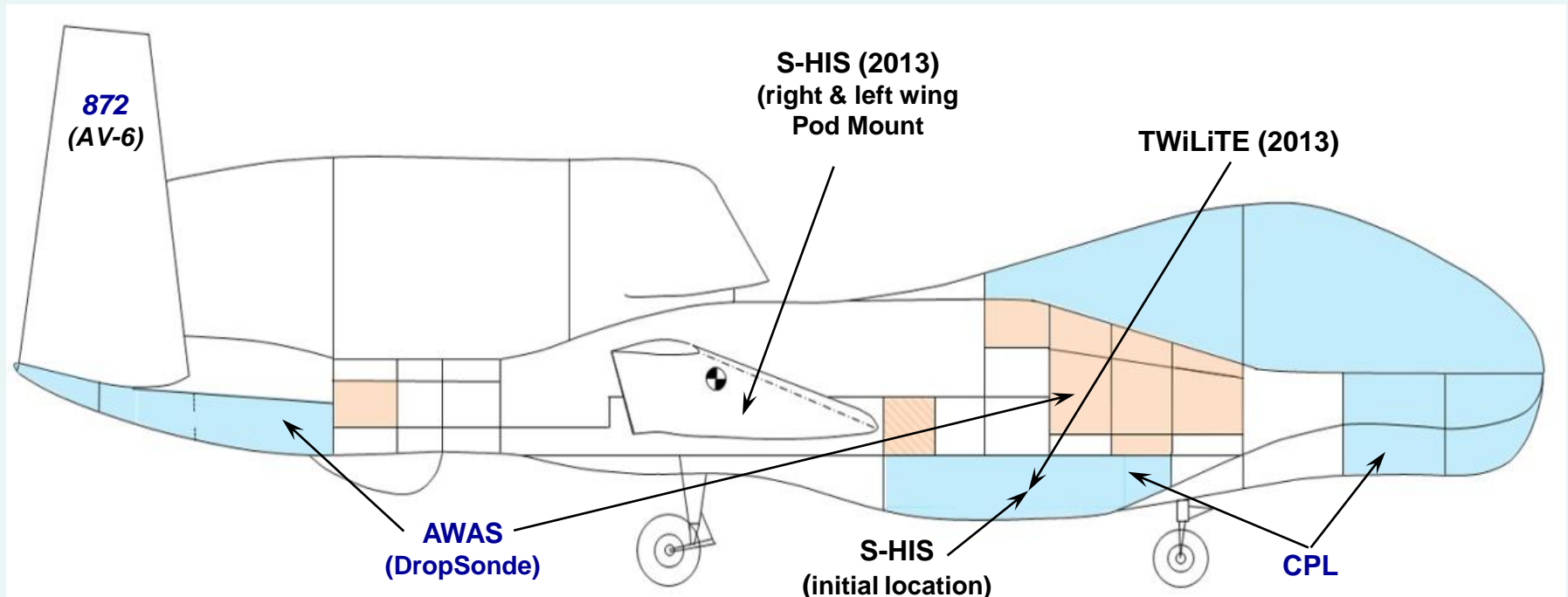
5 Flights, 126 hours, 42,000 nm – 50+ ‘eye’ over-flights

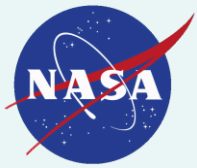


HS3 Payload Integration



AV-6 “Environmental” Instrument Configuration

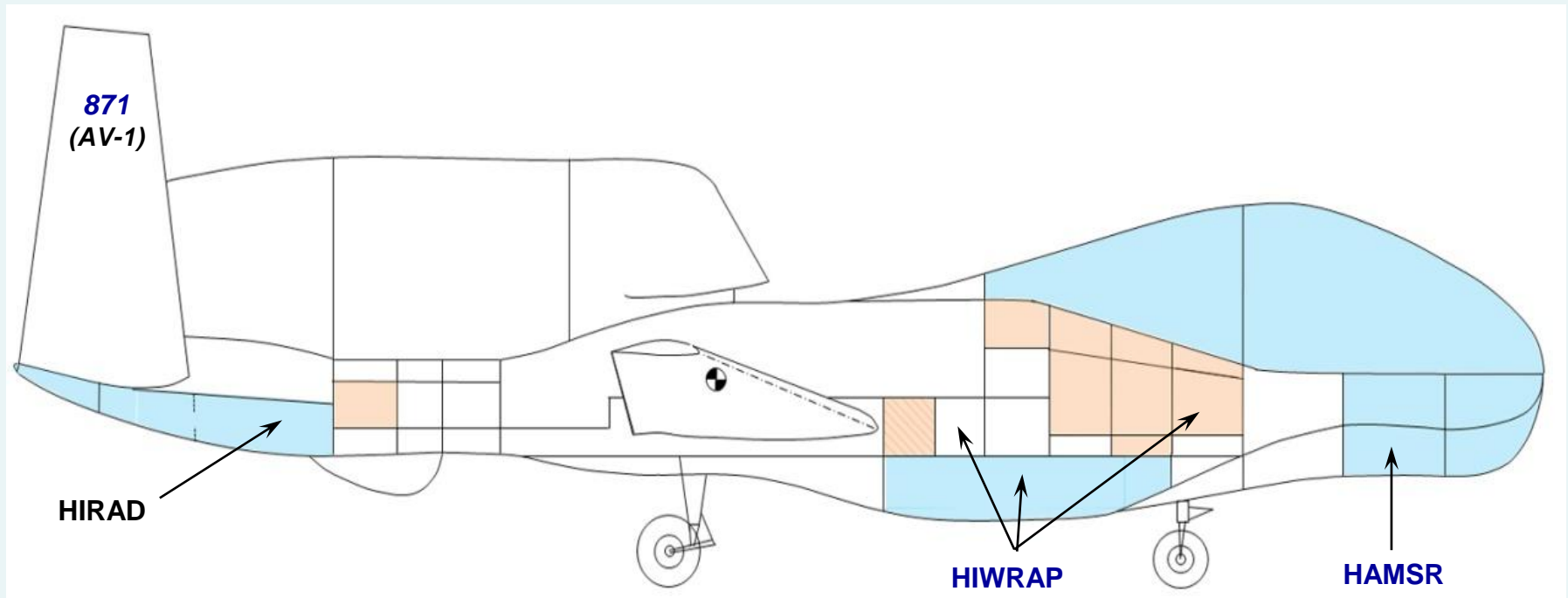




HS3 Payload Integration



AV-1 “Over Storm” Instrument Configuration

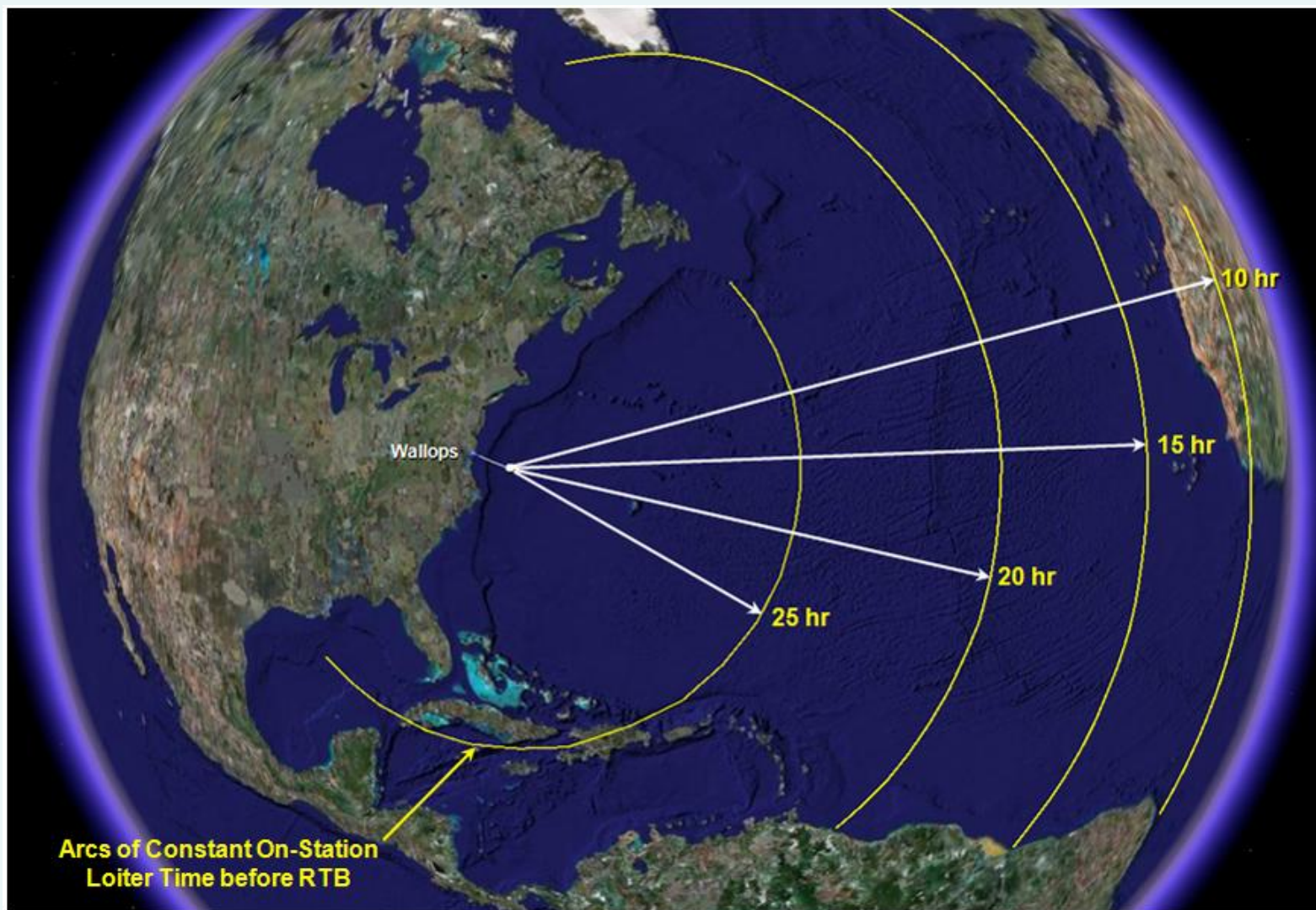


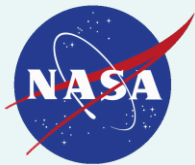


HS3 Operational Capability

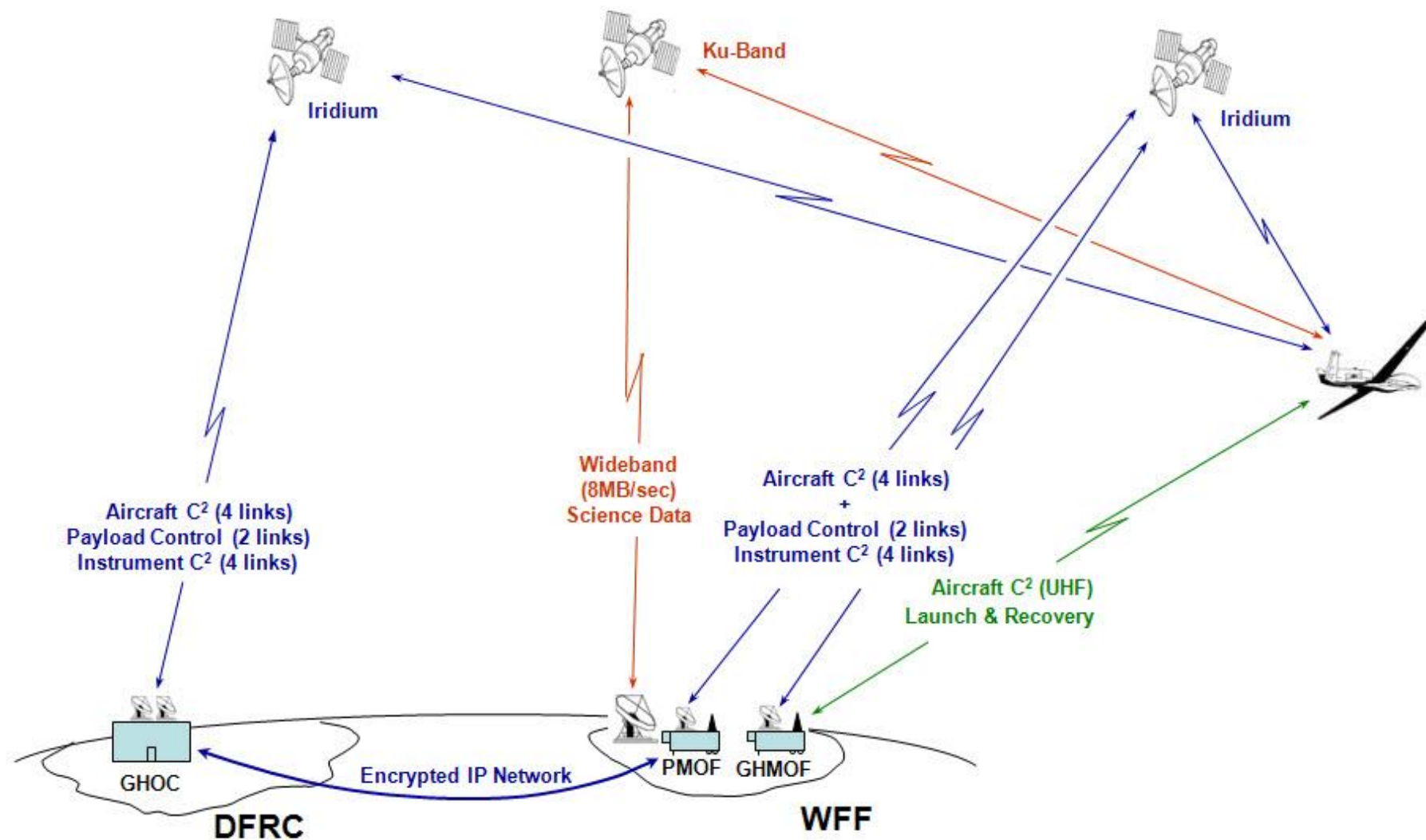


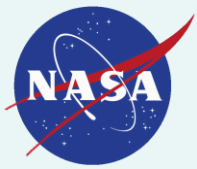
NASA Wallops used for Remote-site Launch & Recovery





A/C & Payload Communications DFRC + Remote Site Facilities

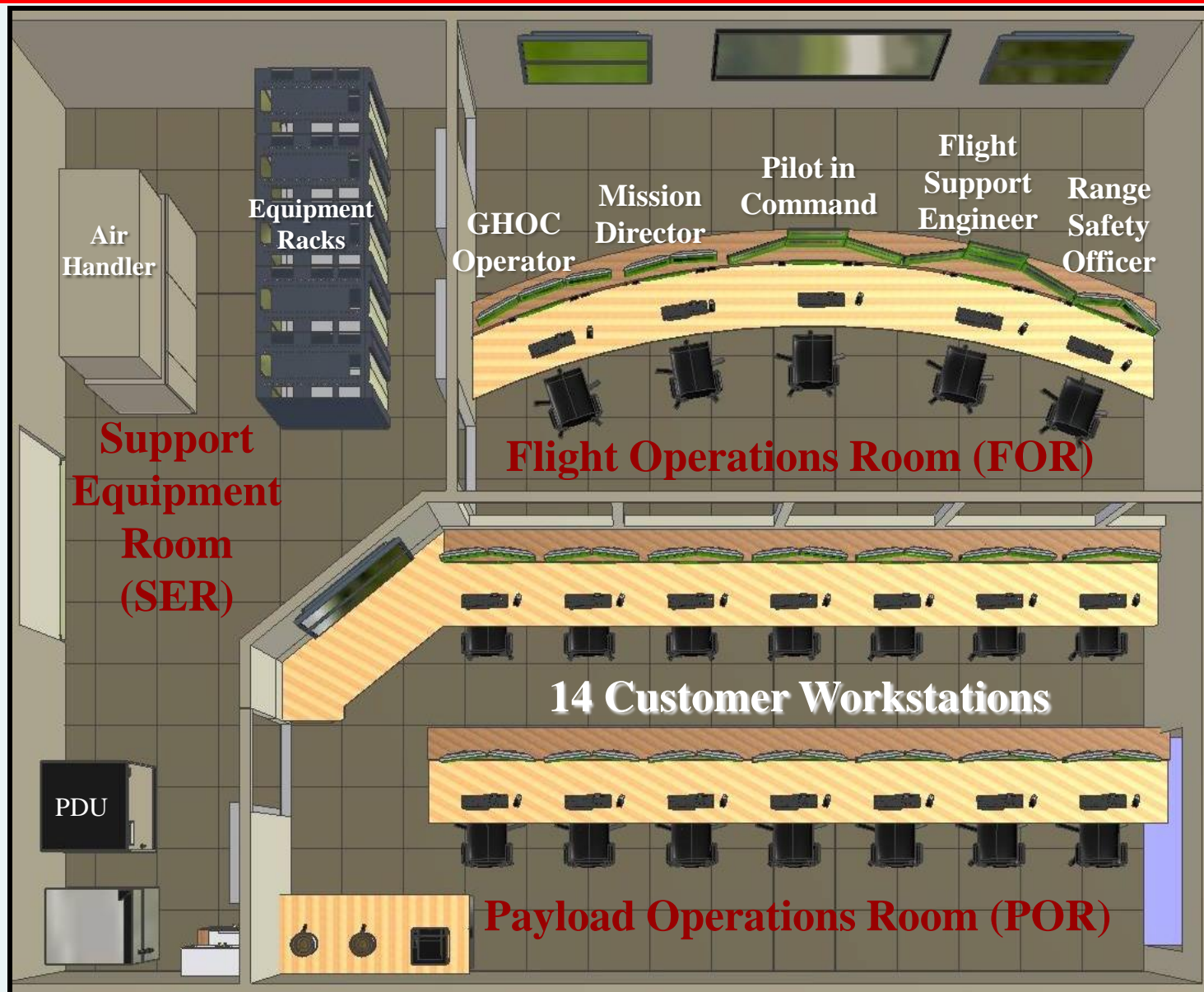


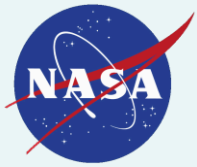


Global Hawk Operations Center (GHOC)



**Facility
Entrance**

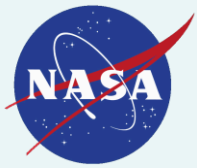




GHMOF



**The GHMOF and Portable Payload Op's Trailer
will be operational next year this time.**

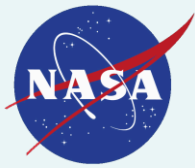


GH Operations Overview



Instrument Loading



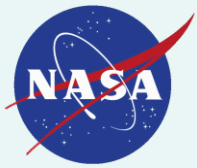


GH Operations Overview



Instrument PI Preflight Sign-off



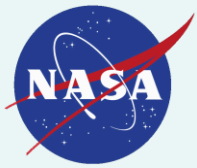


GH Operations Overview



Mission Staging Location T-3H



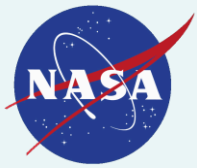


GH Operations Overview



Payload Ops Area T-1.5H



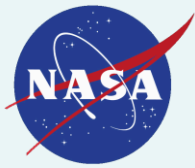


Key Op's Questions, Issues

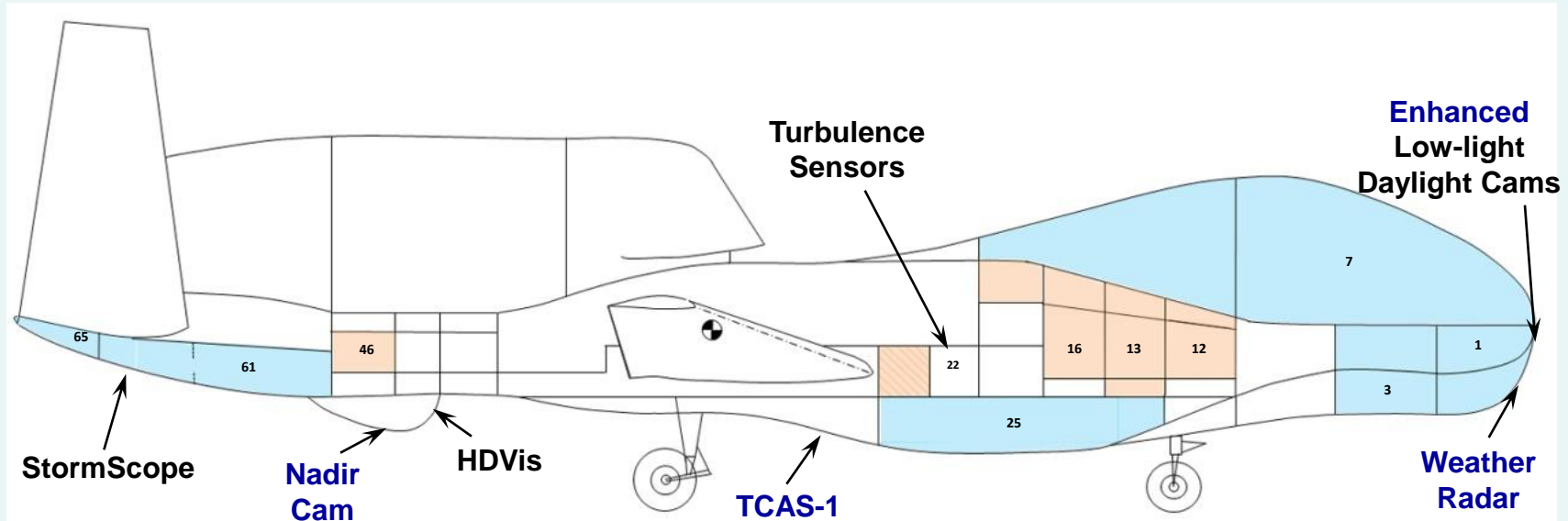


- **Flight Duration**
 - Average is increasing as team gets more experience: ~28 hrs
 - Deep Radome has ~5% impact
- **Turn-around Time**
 - 2-Shift Op's used during GRIP
 - Pre-flight, Post-flight, fueling requirements, flexibility
- **Hazard Avoidance**
 - Situation Awareness Enhancements being implemented
- **Remote-site Operations**
 - New for the GH Team
 - Staffing at both DFRC & Site





Pilot Situational Awareness Enhancements



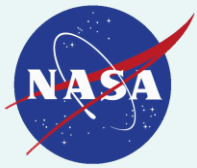
4 Cameras - HDVis, Nose **HD Day** / Low-light, **HD Nadir Cam**

Storm Scope - Lightning Detection Display

Accelerometers - Real-time Turbulence Time-history Display

Weather Radar - X-band Radar in Nose (proposed implementation)

TCAS-I - SkyWatch Display (proposed implementation)



Lessons Learned



- **GH Team**
 - Integration experience – schedule impacts
 - Staffing Issues being worked
- **Payload Comm's**
 - Wideband Data use
 - Instrument C2
- **Flight Ops**
 - COA experience expanding
 - International experience
 - Mod's to GH FOM expanding
 - Lightning
 - Storm overflight
 - Hurricane experience by Flt. Team

